AMIP PROJECT NOMINATION

PROJECT TITLE: Army Object Standards Development

PROJECT PRIORITY: 1

POINT OF CONTACT: Army Materiel Systems Analysis Activity (AMSAA)
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EXECUTIVE SUMMARY: Object Management Standard Category (OMSC) members will design, test, and document objects for use as standards in Army model and simulation. Activities to be conducted are

- Object development:
    - Environment Objects (Terrain, Atmosphere, Space, and Ocean Objects)
    - Simulation Services Objects
    - Logistics Support Services Objects
    - Behavior Framework/Object Integration

- Linkage of Platform and Unit Objects to standard algorithms
- Test use of Platform, Unit, and Environmental Objects in Object-Oriented (OO) Simulation Environment
- Update of OMSC website to allow easy navigation of objects, object methods, object definitions, and access to standard algorithm sources

FUNDING PROFILE:

$K	Prior Funding & Source	FY 99 OMA	FY 99 OPA	Project Total
AMIP Funds	120	125		250
Other Source(s) of Funding*	75 (AMSAA) 45 (AMSO)	50 (AMSAA)		125 45
Total	240	175		420

II. BACKGROUND AND TECHNICAL DESCRIPTION OF THE PROBLEM

Object-oriented programming offers the potential for increased code reuse, maintainability, and ease of developing new simulations. Because of these benefits, the use of object-oriented technologies will increase over time. To prevent duplication of effort and the development of incompatible models, the Deputy Undersecretary of the Army for Operations Research directed the development of standard Army objects. This proposal encompasses the tasks necessary to develop new objects as well as conduct the testing, documentation, and coordination of standard objects to insure that they contain the minimum essential elements necessary for widespread application.

III. TECHNICAL APPROACH

Based on the component-based OMSC design philosophy, this effort will develop functional definitions of objects that are robust and reusable by different simulation applications. The approach resembles the model-test-model methodology used by the M&S community. Specifically, this project will first develop a set of objects, object methods, and object metadata proposed for M&S community use (see following list). These objects will undergo testing through application in an object-oriented simulation environment (e.g., G2). The draft object will then be coordinated with representatives of the M&S community to obtain consensus (i.e., the AMSO Policy and Technology Working Group and the Army M&S Standards Categories). Finally, the draft objects will be documented via a technical report and submitted to SNAP for approval and entry into ASTARS. Additionally, objects developed by other activities will be reviewed as potential object standards. The following will be addressed in this AMIP proposal:

- New object development:
    - Environment Object: comprised of Terrain, Atmos, Space, and Ocean Object;
    - Simulation Services Objects: represents functions such as the Simulation Engine, Simulation Management, Event Mangers, etc.;
    - Logistics Support Services Objects: represents assembly points, maintenance facilities, etc.
    - Behavior Framework/Object Integration: classification and integration of the manner in which behavior, from individual soldiers up to command level, is integrated in Army standard objects (i.e., elemental instruction sets, combat instruction sets, and command decision modeling sets)

- Linkage of Platform and Unit Object methods to standard algorithms: this will provide documentation on the standard algorithms and algorithm sources necessary to execute the Platform and Unit object methods. If standard algorithms cannot be found, a SNAP Standard Requirement Document will be submitted.
- Sample execution of the Platform and Unit Object in an OO simulation environment: this exercise will select and build a sample OO simulation using the standard objects to ensure that the minimal essential set of object elements are defined.
- Updated website that will list objects, object methods, object definition, and standard algorithm references.

IV. PRODUCTS

The following reports will include a description of the object, object metadata, and object definitions. Also included will be the results of the test application of the object to existing or developmental simulations:

- Environment Objects Report
- Simulation Services Objects Report
- Logistics Services Support Objects Report
- Behavior Framework/Object Integration Report
- Platform Object Standard Algorithm Reference Report
- Unit Object Standard Algorithm Reference Report
- Updated website to provide documentation and references to object instantiation

V. MILESTONES

	O	N	D	J	F	M	A	M	J	J	A	S
Environ Objects	←———————————————————→											
Simulation Services Objects	←———————————————————→											
Logistic Support Services Object			←——————————————→									
Behavior Frame	←———————————————————→											
Platform/Unit Object Testing			←——————————————→									
Update Website									←——————————→			

VI. RISK/BENEFIT ANALYSIS

The projected cost for this project is $125,000. The risk to complete this effort is low. Initial solutions to the problems addressed by this project have been discussed within the OMSC. The major challenge is to develop a set of solutions tailored to the needs of the Army M&S community and have widespread applicability. The ultimate benefits to be derived from the availability of standard Army objects include:
- reduced knowledge engineering development efforts for new models
- enhanced interoperability/interactivity
- reduction in duplication of effort, and
- identification of investment opportunities to address modeling and
   simulation voids.

EXECUTABILITY
The funding requested for this project will be used for in house government labor at AMSAA, NSC, STRICOM, TRAC-WSMR, TRAC-FLVN, TRAC-MTRY, and CAA.